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INDIANAPOLIS, IN
07/28/1999

Decision Document

for

AOC 18 - Northeast Land Scar Area

Naval Air Warfare Center

Indianapolis, Indiana

Southern Division
Naval Facilities Engineering Command

Contract Number N62467-94-D-0888

Contract Task Order 0012

July 1999

DECISION DOCUMENT
FOR
AOC 18 - NORTHEAST LAND SCAR AREA

NAVAL AIR WARFARE CENTER
INDIANAPOLIS, INDIANA

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
Southern Division
Naval Facilities Engineering Command
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North Charleston, South Carolina 29406

Submitted by:
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661 Andersen Drive
Foster Plaza 7
Pittsburgh, Pennsylvania 15220

CONTRACT NUMBER N62467-94-D-0888
CONTRACT TASK ORDER 0012

JULY 1999

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TABLE OF CONTENTS

FIGURES

NUMBER **PAGE NO.**

ACRONYMS

AOC	Area of Concern
ARAR	Applicable or Relevant and Appropriate Requirements
BCT	BRAC Clean-up Team
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CIP	Community Involvement Plan
CFR	Code of Federal Regulations
COPC	Chemicals of Potential Concern
DCE	Dichloroethene
IDEM	Indiana Department of Environmental Management
IR	Installation Restoration
mg/kg	milligram per kilogram
NAVFAC	Naval Facilities Engineering
NAWC	Naval Air Warfare Center Command
NCP	National Contigency Plan
OSHA	Occupational Safety and Health Administration
PCB	Polychlorinated biphenyl
PCE	Tetrachloroethene
PRG	Preliminary Remediation Goal
RAB	Restoration Advisory Board
RBC	Risk Based Concentration
RI	Remedial Investigation
RCRA	Resource Conservation and Recovery Act
SOUTHDIV	Southern Division, Naval Facility Engineering Command
SSL	Soil Screening Level
TCA	1,1,1-Trichloroethane
TCE	Trichloroethene
USEPA	U.S. Environmental Protection Agency
USGS	United States Geological Survey
VOC	Volatile Organic Compound

1.0 DECLARATION OF THE DECISION DOCUMENT

1.1 SITE NAME AND LOCATION

AREA OF CONCERN ONE (AOC18)
NORTHEAST LAND SCAR AREA
NAVAL AIR WARFARE CENTER (NAWC) INDIANAPOLIS
INDIANAPOLIS, INDIANA

1.2 STATEMENT OF BASIS AND PURPOSE

This Decision Document presents the selected remedial action for the northeast land scar area (AOC18) NAWC Indianapolis, Indianapolis, Indiana, developed in accordance with CERCLA, as amended by SARA, to the extent practicable, the National Contingency PIan. This decision is based on the administrative record for this Site, at the Warren Library, Indianapolis, Indiana.

The State of Indiana and the U.S. EPA concur on the selected remedy.

1.3 ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action selected in this Decision Document, may present an imminent and substantial endangerment to public health, welfare, or the environment.

1.4 DESCRIPTION OF THE SELECTED REMEDY

AOC 18 encompasses contamination at the Northeast Land Scar Area. Based on current Site conditions it has been determined that future risk to human health and the environment would be within acceptable limits assuming continued industrial use. Therefore, no further remedial action beyond those institutional (i.e. land use) controls specified in this document is planned.

The major components of those institutional controls selected for implementation include:

- Restricting future land use to non-residential purpose to specifically include, but not limited to, the prohibition of playgrounds, day care facilities and facilities for the elderly.

- Retention of a right of access by the Navy, and Federal and State regulators for purposes of undertaking future environmental investigations, inspections and/or remedial actions.

1.5 STATUTORY DETERMINATION

Because this remedy will result in the contamination remaining on-site, the Navy will conduct a review every five years after the commencement of remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

1.6 DECLARATION

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. This remedy utilizes alternative solutions and treatment technologies to the maximum extent practical for this site. However, because active treatment of the principal threats of the site was not found to be practical, this remedy does not satisfy the statutory preference for treatment as a principal element of the remedy. The size, location, and amount of contamination found at AOC 18 precludes a remedy in which contaminants could be treated effectively.

Carl Loop — 9/2/99

Carl Loop, US Navy, Southern Division (SOUTHNAVFACENGCOM)
BCT Member — Date

Concurrence:

Denise Boone — 9/8/99

Denise Boone, USEPA, Region V
BCT Member — Date

Sean Grady — 9/2/99

Sean Grady, Indiana Department of Environmental Management
BCT Member — Date

2.0 DECISION SUMMARY

2.1 SITE NAME, LOCATION, AND DESCRIPTION

NAWC Indianapolis is located in Marion County, east of downtown Indianapolis within a predominantly residential/commercial area (See Figure 2-1). NAWC Indianapolis is bordered by East 21st Street to the north, Arlington Avenue to the west, East 16th Street to the south, and a small waterway, Windsor Branch, to the east. Most of the commercial establishments within the immediate vicinity of NAWC Indianapolis are located along East 21st Street or Arlington Avenue. Businesses in the area include gas stations, car washes, dry cleaners, and office buildings. The areas immediately beyond the businesses lining East 21st and Arlington Avenue are predominantly residential, as are the areas south and east of the NAWC.

In late 1995, the Department of Defense decided to place the NAWC Indianapolis on the base realignment and closure list. This initiated the conversion of the facility from a government-owned and operated facility to the private sector. The NAWC Indianapolis is currently under the direction of Raytheon, under lease from the City of Indianapolis, who, in turn, leases the property from the U.S. Government. Figure 2-2 shows a layout of NAWC Indianapolis and the location of AOC 18.

The ground surface at NAWC Indianapolis is generally flat, sloping slightly from the northern boundary toward the southeast. Surface water drainage at the facility mostly occurs as overland flow during heavy precipitation events. This overland flow is collected and routed through a storm sewer system to two discharges locations: (1) a nearby stream to the southeast of the facility via permitted spillways and an off-site storm sewer system; and (2) a water retention pond in the southwest portion of the site. The retention pond was constructed to facilitate surface water infiltration and to alleviate ponded water on the facility grounds.

The unconsolidated glacial overburden is approximately 150 feet thick at the facility and is comprised of three aquifers or aquifer zones, namely the shallow aquifer zone, middle aquifer and deep aquifer. Each of these varies in thickness, composition, and horizontal extent throughout the site area. The shallow aquifer may be unconfined or semi-confined in some areas where it is near to the ground surface or where it is not overlain by till or other low permeability materials. The shallow aquifer ranges in thickness from 0.5 to 25 feet; the middle aquifer ranges in thickness from 1 to 34 feet; and the deep aquifer ranges in thickness from 5 to 26 feet. The shallow and middle aquifers are only believed to be horizontally continuous on the eastern and southern portions of NAWC Indianapolis, whereas the deep aquifer is

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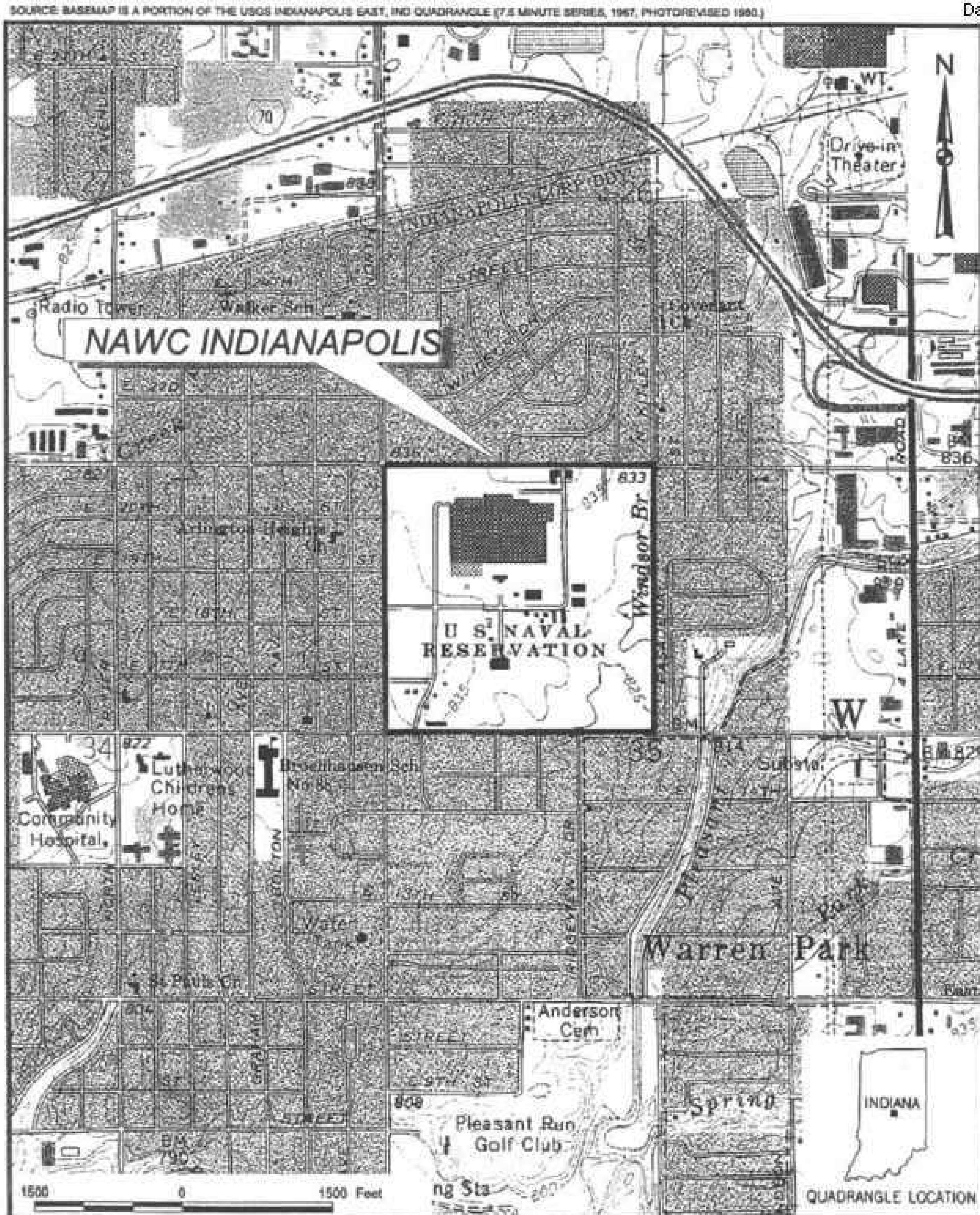
SOURCE: BASEMAP IS A PORTION OF THE USGS INDIANAPOLIS EAST, IND QUADRANGLE (7.5 MINUTE SERIES, 1967, PHOTOREVISED 1980.)



DRAWN BY D. PERRY	DATE 12-SEP-98		SITE LOCATION MAP	CONTRACT NUMBER	
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SCALE AS NOTED			MARION COUNTY, INDIANA	DRAWING NO. FIGURE 2-1	REV 0

P:\GIS\7173\7173_PROPOSED_PLAN.APR 17-NOV-98 DMF LOCATION MAP LAYOUT

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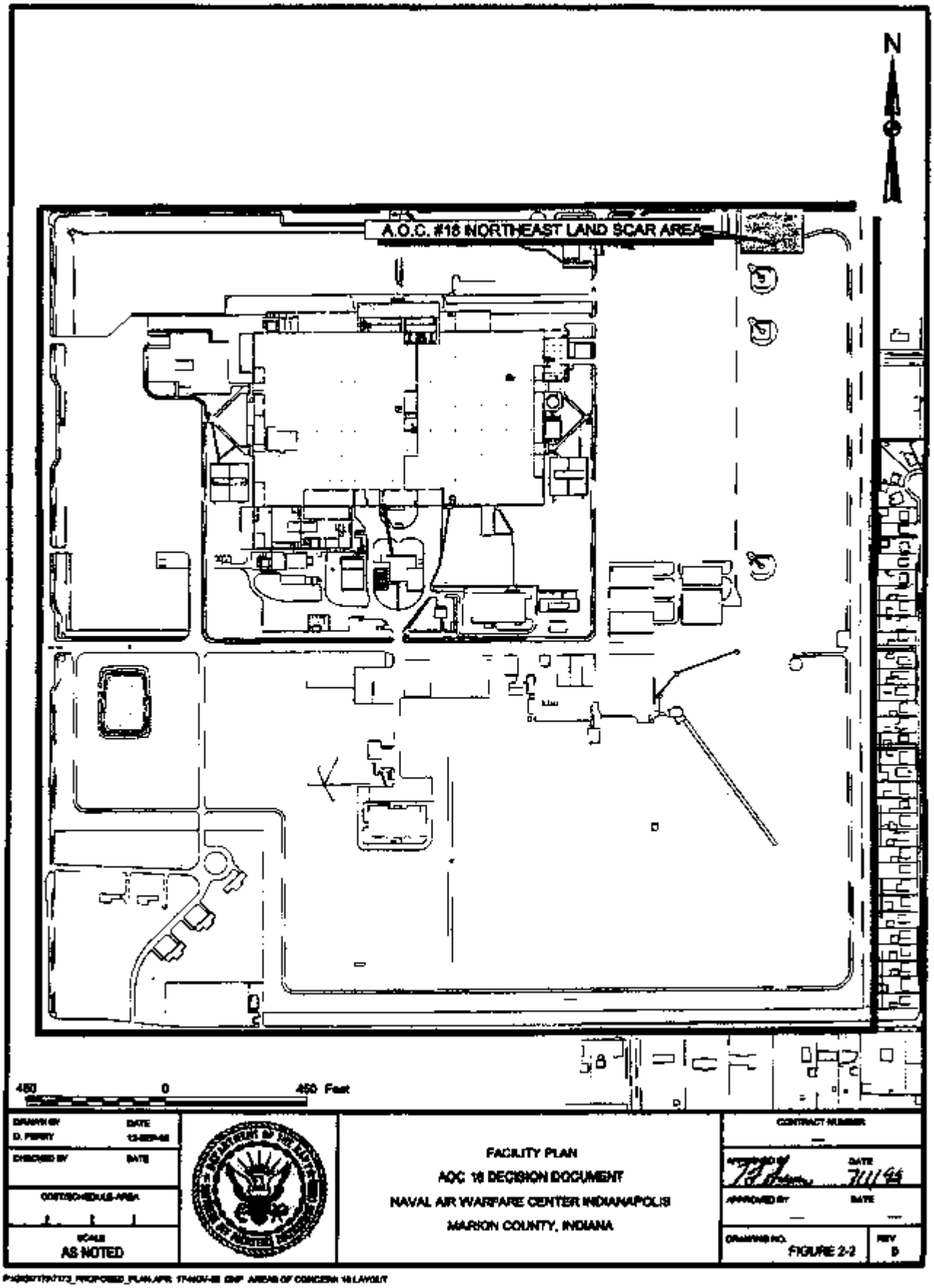
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MARION COUNTY, INDIANA
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APPROVED BY
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FIGURE 2-2
REV
B

expected to be horizontally continuous throughout the entire NAWC. Each of these aquifer zones are separated by low permeable glacial till aquitards. The aquitard between the shallow and middle aquifers ranges in thickness between 15 to 19 feet and the aquitard between the middle and deep aquifer ranges between 23 and 41 feet thick.

The groundwater flow direction across the facility in the shallow and middle aquifer zones is generally to the southeast and south, while flow in the deep aquifer is southwest. It is likely that groundwater in the shallow aquifer discharges into Windsor Branch and Pleasant Run to the east and southeast of the facility. The average horizontal hydraulic gradient for the shallow aquifer was 0.0071 ft/ft on December 10, 1996 and 0.0116 ft/ft on September 27, 1997. The average horizontal hydraulic gradient is 0.014 ft/ft in the middle aquifer, and 0.005 ft/ft in the deep aquifer. The average vertical gradient between monitoring wells screened in the shallow and middle aquifer is 0.5 ft/ft downward in the north-central and southern edges of the NAWC. Between the shallow and middle aquifers, the average vertical gradient in the northeastern corner of the NAWC is 0.13 ft/ft upward. This upward gradient indicates potential recharge of Windsor Branch immediately east of the NAWC from the shallow aquifer. The average hydraulic gradient between the middle and the deep aquifer is 1.3 ft/ft. For additional information on the geology and hydrogeology at the NAWC Indianapolis please refer to B&R Environmental (1997) and USGS (1997, 1998).

2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES

A 1951 aerial photograph of NAWC revealed an area devoid of vegetation in the northeast corner of NAWC, directly north of the ballfields. The area may simply be a soil borrow location, however, no additional information is available. Conservatively, the area was identified as an area to be sampled during the RI.

The NAWC Indianapolis, under the office of the Chief of Naval Operations (CNO) initiated an Environmental Compliance Evaluation (ECE) program to identify environmental compliance deficiencies, provide recommendations for corrective action, and establish a basis for future budgets. The first ECE was performed in October 1991. The next ECE was performed in 1994, at which time a total of 21 environmental media/program areas were evaluated. The ECE's are maintained on site. Environmental programs and procedures were typically updated to meet ECE deficiencies.

In anticipation of the transfer from the government to the private sector, an Environmental Baseline Survey (EBS) was prepared by Brown & Root (B&R) Environmental (March 1996) to document the results

of a modified Phase I environmental site assessment. The site assessment was performed in accordance with the U.S. Department of Defense (U.S. DOD) requirement for property intended to be sold, leased, transferred or acquired. The EBS reported findings on the status of the NAWC Indianapolis property and off-base property based on visual inspections and a review of records.

The Remedial Investigation began with the collection of Phase I environmental samples from October through December 1996. Additional samples were added in September 1997. A Phase I Remedial Investigation report was issued in December 1997 which presented the analytical results and evaluated the potential human health risks associated with the NAWC facility. Based on these findings, additional Phase II samples were collected at selected areas during the spring and summer of 1998.

2.3 HIGHLIGHTS OF COMMUNITY PARTICIPATION

A Community Involvement Plan (CIP)(May 1997) was developed for NAWC Indianapolis that identifies a program to establish communication and information exchange between the Navy, and various federal, state and local agencies, and community agencies; and the public. Specifically, this provides a mechanism for the exchange of information between the BRAC Cleanup Team (BCT) and the public, primarily through the Restoration Advisory Board (RAB). The BCT and RAB periodically hold public meetings to provide full exchange of information and to provide an opportunity for public comment.

The Navy solicited input from the community for the proposed plan on the selected alternative for each response action. The Navy originally set a public comment period from September 28, 1998 to October 27, 1998, and later extended it until November 11, 1998, to encourage public participation in the selection process. The comment period included a public meeting at which the Navy, with the EPA and IDEM, presented the Proposed Plan, answered questions, and accepted both oral and written comments. The public meeting was held on October 14, 1998 from 7:00 PM to 9:00 PM from at the Quality Inn East at 3525 North Shadeland Avenue in Indianapolis.

As indicated by the public notices, all documents pertinent to AOC 18 were made accessible to the public at the information repository located at the Warrant Branch Library, 9701 East 21st Street, Indiana.

2.4 SCOPE AND ROLE OF ACTION

The sites that required environmental investigations as part of the Remedial Investigation at NAWC Indianapolis comprised eighteen areas of concern and one Installation Restoration (IR) site. This

Decision Document addresses the contamination of the soil and groundwater associated with one AOC: AOC 18 - Northeast Land Scar Area. This AOC was determined in the RI to be a relatively low risk site within the NAWC Indianapolis facility. The objective of the action described in this Decision Document is to maintain this low level of risk by controlling the site for non-residential uses. The AOC is addressed independent of the other AOCs and the IR. The other AOCs will be addressed in other Decision Documents, and the basewide groundwater conditions will also be evaluated in a separate document.

2.5 SUMMARY OF SITE CHARACTERISTICS

2.5.1 Geology

The geology of the AOC 18 is consistent with the geology found across the NAWC facility. Due to the shallow investigation depth, borings installed in AOC 18 only partially penetrated through the unconsolidated surficial fill and glacial deposits. Brown clayey silt with traces of sand and gravel were found from ground surface down to approximately 2 to 4 feet bgs in AOC 18. Underlying this layer yellow brown to gray silty clay with traces of sand and gravel was found down to 22 feet bgs. Withinn this silty clay layer occasional thin layers of clayey sand and silty sand and gravel ranging from 0.2 to 1.0 foot thick can be found between 11 to 13 feet bgs.

2.5.2 Hydrogeology

Southeast of AOC 18, USGS (1997) installed two monitoring wells, one in the shallow aquifer which was screened from 808.3 to 813.3 feet amsl (20 to 25 feet bgs) and one in the middle aquifer zone which was screened from 780.3 to 790.3 feet amsl (33 to 43 feet bgs). The potentiometric surface in the shallow well ranged from 8 to 10 feet bgs. The potentiometric surface in the middle aquifer well ranged from 5.7 to 6.9 feet bgs. USGS (1997) calculated a upward vertical hydraulic gradient of 0.13 from the middle to shallow aquifer zones in the vicinity of AOC 18. Rising and falling head slug test results indicate that the average horizontal hydraulic conductivity is 4.1 feet/day for the shallow zone and 1.4 feet/day for the middle aquifer zone in the vicinity of AOC 18.

2.5.3 Nature and Extent of Contamination

Surface and Subsurface Soil

Five surface and six subsurface soil samples were collected from 5 direct push soil borings advanced at AOC 18. All of the samples were analyzed for VOCs. However, only the samples from location AOC18-

DP03 were analyzed for semivolatile organic and metals. All soil samples were also initially screened for VOC contamination using a field GC unit.

Field screening of these surface and subsurface soils for volatile organics yielded low level positive results (approximately less than 50 µg/kg) for chloroform, acetone, 2-butanone, benzene, carbon tetrachloride, and trichloroethene. None of these compounds were detected when these samples were analyzed by the fixed-base laboratory. All samples collected were analyzed for volatile organic compounds by the fixed-base laboratory. Only surface and subsurface soils collected from AOC18-DP03 were also analyzed for semivolatiles and metals by the fixed-base laboratory. All data generated by the fixed-base laboratory were validated according to EPA National and Region V guidelines.

Surface Soil

No volatile organic compounds were detected in surface soil samples collected and sent to CEIMIC, Inc. for analysis. Bis(2-ethylhexyl)phthalate, di-n-butylphthalate, and metals were detected in surface soil sample AOC18DP00301. However, none of these compounds were detected at concentrations that exceeded background and the established benchmarks.

Subsurface Soil

No volatile organic compounds were detected in the subsurface soils. Only, metals were detected in subsurface soil samples AOC18DP00302 and AOC18DP00303. However, none of these compounds were detected at concentrations that exceeded background and the established benchmarks.

Groundwater

No groundwater samples were collected at this site.

2.6 SUMMARY OF SITE RISKS

During the RI, an analysis was conducted to estimate the health or environmental problems that could result if the soil contamination at AOC 18 was not mitigated. This analysis is commonly referred to as a baseline risk assessment. In conducting this assessment, the focus was on health effects that could result from exposure to the soil and groundwater contaminants in both an industrial and a residential

setting. The industrial setting considered the exposure by on-site workers, construction workers and adolescent trespassers. Residential exposure considered on-site exposure to the soil by future use of the site as residential property. At AOC 18, eleven soil samples were collected from five borings at the AOC, and no groundwater samples were collected. In samples collected during the RI, contaminants were detected in the soils at the AOC.

The concentrations were compared to risk assessment criteria for residential and non-residential use. Criteria that were used to evaluate direct contact exposures were EPA Region III Risk Based Concentrations (RBCs), EPA Region IX Preliminary Rernediation Goals (PRGs), IDEM Tier II Goals, and site-specific background concentrations. In addition, EPA Generic Soil Screening Levels (SSLs) and IDEM Tier II Goals were used to evaluate the potential for a chemical to migrate from the soil to the groundwater. If a chemical concentration in soil was found to be greater than one of the criteria (or 10% of PRG or RBC in the case of non-carcinogens), then the chemical was designated as a Chemical Of Potential Concern (COPC) and was considered for further risk analysis. Concentrations of inorganic chemicals were also compared to site specific background concentrations.

Based on the laboratory analyses, the only COPC detected in the soil was thallium (1.9 mg/kg maximum). The only criteria that was exceeded is the EPA Generic Soil Screening Level (SSL). The SSL criteria assumes residential use, and since the future anticipated uses of the site were assumed to be non-residential, the criteria is not applicable and the risk level was not evaluated further. None of the residential and non-residential direct exposure criteria were exceeded. The most restrictive criteria that were used for determining the COPCs use a risk level of 1.0×10^{-6} in the calculation of the criteria. Thus, it was not necessary to calculate risk levels since the risk of exposure for any residential or non-residential receptor is less than the EPA criteria of 1.0×10^{-6}.

The available data suggested that the chemicals detected in the soil were not migrating off-site, therefore, risks based on off-site residential use of the groundwater were not evaluated. There are no on-site wells and the area is serviced by a public water supplier so risks by on-site consumers (present or future) were not evaluated.

The planned future use of the site is industrial, so the risks based on those uses were given more consideration than residential use. Alternatives for addressing the site were based on the continued industrial use of the site.

A baseline ecological risk assessment was also performed. The ecological risk assessment compared soil sample analytical results to Ecological Screening Levels. Ecological Screening Levels are based on EPA Region III Biological Technical Advisory Group (BTAG) values and “B level” criteria developed by The Netherlands and the Province of Quebec. If a chemical concentration in soil was found to be greater than one of the criteria, then the chemical was designated as a COPC and was considered for further risk analysis. COPCs were then used to evaluate the risk to wildlife receptors by calculating hazard quotients using a simple food chain model developed by the EPA Emergency Response Team. Finally, site specific factors were examined to evaluate the likelihood that a COPC may actually pose a risk. Such factors include the COPC concentration relative to the background, frequency and magnitude of detections, relationship of average COPC concentration to screening level, area affected, probable bioavailability, and degree in which wildlife are expected to use the area. In addition to contaminants in the surface soil, contaminants in the groundwater were modeled to predict their concentrations in Pleasant Run. The predicted concentrations were compared to surface water criteria. Contaminants with concentrations above the surface water criteria were retained as COPCs. Following the evaluation of the above information, COPCs that were judged likely to pose a potential risk under the site conditions were identified as chemicals of concern for further evaluation.

Based on the results of the surface soil analyses, only di-n-butyl phthalate was identified as a COPC. This compound was identified only because it lacked a screening level. The hazard quotients calculated by the model show that there is a potential risk to wildlife. The concentrations of metals were less than either the background values or the screening values. AOC 18 is an open grassy areas that provides little habitat. Thus, when the site-specific factors are considered, the ecological risks for the site are considered to be minimal. The COPCs was not considered to be a chemical of concern, and no further ecological evaluation was made.

The summary of the analytical results and risk assessment tables from the RI report are included in Appendix A. A figure depicting the sample locations is also provided in Appendix A.

2.7 DESCRIPTION OF ALTERNATIVES

The alternatives for AOC 5 are presented below. Note that the RI for NAWC Indianapolis has been completed, but the Feasibility Study has not been developed. These alternatives were presented in the Proposed Plan (TtNUS, 1998). The alternatives that were considered are as follows:

- Alternative 1: No Action
- Alternative 2: Institutional Controls

2.7.1 ALTERNATIVE 1: NO ACTION

The “No Action” alternative is evaluated at every site to establish a baseline for comparison. Under this alternative, no further action would be taken to prevent exposure to the contamination in the soil.

There are no capital costs, operations and maintenance costs, and present worth costs associated with this alternative. There is no implementation time associated with this alternative.

2.7.2 ALTERNATIVE 2: INSTITUTIONAL CONTROLS

Institutional controls will be put in place to maintain the industrial use of the site. The alternative is consistent with the proposed use the property in the future. The institutional controls consists of deed restrictions that include:

- a clause restricting the land use to non-residential and specifically prohibiting uses such as, but not limited to, day care facilities and facilities for the elderly.

- a clause retaining the rights of access by the Navy, and Federal and State regulators for environmental investigations, inspections and/or remedial actions.

An Institutional Controls Plan (ICP) has been prepared to ensure the long term effectiveness of the institutional controls. The plan was developed according to EPA guidance. This plan includes a description of the areas controlled by the deed restrictions, description of site, identification of residual risk(s) presented, types of ICs imposed, proposed deed language implementing ICs, party responsible for monitoring the integrity and effectiveness of imposed control(s), procedures for reporting and enforcing against IC violations, assurances regarding completion of the CERCLA five-year review process, IC recordation / notice requirements, and commitment to pre-transfer meeting.

Since contamination will remain on site and a remedial action, institutional controls, is implemented, a five-year review of the remedy is required. No routine monitoring is proposed for AOC 18 since the groundwater data, as reported in the RI report and Phase II Technical Memorandum, shows that there

were no detections of contaminants above screening levels at sampling locations immediately downgradient of AOC 18.

There are no capital costs associated with this alternative although there will be some costs associated with routine administration and the five-year review (presented below). The implementation time to prepare and finalize the deed restriction language is estimated to be two months.

Note that this alternative does not employ any treatment or removal technologies. Human health and the environment is protected by this remedy without the need for further physical changes.

Total Five Year Costs(1)

	Total hours	Labor Costs	Airfare/Lodging per diem/auto costs	AOC 18(2) Costs
Routine Administration	10	$350		
Parcel Transfer				
Trip 1	12	$420	$556	
Trip 2	12	$420	$556	
Five Year Review	12	$420	$556	
Problem Resolution				
Number 1	12	$420		
Number 2	12	$420		
Total		$2,450	$1,668	$412

1 Total five year costs included costs associated with AOC 1, AOC 5, AOC 6, AOC 7, AOC 8, AOC 9, AOC 15, AOC 17, and AOC 18.
2 AOC 18 costs are based as a percentage (10%) of the total five year costs.

2.7.3 Other Alternatives

The current use of the facility and site is industrial. The intended future use of the site is industrial and the intended use of the facility is non-residential. Alternative 2 - Institutional Controls was evaluated and found to be protective of human health and the environment.

As required by the NCP, other alternatives were considered but were determined by the BCT to be not appropriate for the levels of contamination found at the AOC. Since Alternative 2 is protective of human health and the environment, no other alternatives were evaluated in detail. Other alternatives are

variations of soil remediation, such as excavation and disposal. These alternatives share several general characteristics. All require capital expenditure for field work and disposal. All require an implementation time of six to twelve months for design, bidding, procurement, and site work.

Any of these other alternatives can be expected to be evaluated favorably with the nine criteria. However, the resulting protection of human health and environment is the same as the institutional controls. The costs for implementation of remediation alternatives provide no additional benefit compared to the institutional controls. Thus, a detailed evaluation of alternatives was not made and treatment alternatives were not considered further.

2.8 SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

The preferred alternative for AOC 18 is Alternative 2 - Institutional Controls. Based on current information, this alternative would appear to provide the best balance of trade-offs among the alternatives with respect to nine criteria that EPA uses to evaluate alternatives. This section profiles the performance of the preferred alternative against the nine criteria, noting how it compares to the other alternatives under consideration. The nine criteria are summarized below.

Overall Protection of Human Health and Environment addresses whether or not a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced or controlled through treatment, engineering controls or institutional controls.

Compliance with ARARs addresses whether or not a remedy will meet all of the Applicable or Relevant and Appropriate Requirements of other Federal and State environmental statutes and/or provide grounds for invoking a waiver.

Long-term effectiveness and performance refers to the magnitude of residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time once cleanup goals have been met.

Reduction of toxicity, mobility, or volume through treatment is the anticipated performance of the treatment technologies that may be employed in a remedy.

Short-term effectiveness refers to the speed which the remedy achieves protection, as well as the remedy's potential to create adverse impacts on human health and the environment that may result during the construction and implementation period.

Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement the chosen solution.

Cost includes capital and operations and maintenance costs.

State Acceptance indicates whether, based on its review of the RI and Proposed Plan, the State concurs with, opposes, or has no comment on the preferred alternative.

Community Acceptance Indicates whether interested persons in the community support, have reservations about, or oppose the preferred alternative.

2.8.1 Analysis

Overall Protection of Human Health and Environment. All of the alternatives, except for the "no action" alternative would provide adequate protection of human health and the environment by implementing institutional controls or by removing the contaminants. The preferred alternative would implement institutional controls to minimize contact with the contaminants.

Compliance with ARARs. The preferred alternative is in compliance with Federal and State ARARs.

Long-term effectiveness. The preferred alternative would be effective in the long run since the deed restrictions would be maintained through the implementation of an Institutional Controls Plan.

The "no action" alternative provides no long-term safeguards against exposure. Therefore, the alternative will not be considered further.

Reduction of toxicity, mobility, or volume through treatment. The preferred alternative offers no change in the toxicity, mobility or volume of contaminants.

Short-term effectiveness. The preferred alternative can be instituted in a relatively short time. There is no change in the situation while waiting for implementation.

Implementability. The preferred alternative has few administrative issues that will affect its implementation. Deed restrictions have been used in the past at other facilities.

Cost. The preferred alternative has no capital cost and no annual operations and maintenance costs. There are costs associated with the five year review.

State Acceptance. The preferred alternative is in compliance with States ARARs. The State has viewed the preferred alternative favorably.

Community Acceptance. Community acceptance is described in Section 3.0 Responsiveness Summary.

2.9 SELECTED REMEDY

The selected remedy will provide a satisfactory level of risk relative to the current and future intended uses of the site. The level of risk is maintained but with little expenditure. The selected remedy is believed to provide the best balance in trade-offs among the alternatives with respect to the evaluation criteria. The selected remedy, however, does not result in unrestricted use of the site and five-year review of the site will be required.

Alternatives that employ treatment or removal were not considered practical since the risk associated with the site is consistent with the intended future uses of the facility.

2.10 STATUTORY DETERMINATIONS

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. This remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practical for this site. However, because treatment of the principal threats of the site was not found to be practical, this remedy does not satisfy the statutory preference for treatment as a principal element of the remedy. The size, location, and amount of contamination found at AOC 18 precludes a remedy in which contaminants would be treated effectively.

Because this remedy will result in the contamination remaining on-site, the Navy will conduct a review every five years after the commencement of remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

3.0 RESPONSIVENESS SUMMARY

A Proposed Plan for AOC 17 was issued in September 1998. Subsequent to this, the Navy solicited input from the community on the selected alternative. The Navy set a public comment period from September 28, 1998 to October 27, 1998, which was later extended to November 11, 1998, to encourage public participation in the selection process. The comment period included a public meeting at which the Navy, with the EPA and IDEM, presented the Proposed Plan, answered questions, and accepted both oral and written comments. The public meeting was held on October 14, 1998 from 7:00 PM to 9:00 PM at the Quality Inn East at 3525 North Shadeland Avenue in Indianapolis. As indicated by the public notice for the meeting, all documents pertinent to AOC 17 were made available to the public at the information repository located at the Western Branch Library, 9701 East 21st Street, Indianapolis, Indiana.

3.1 COMMUNITY PREFERENCES

Comments were received from one person. The comments concurred with the deed restrictions to limit the land use to industrial, and expressed concern for the land use to be changed to residential or permit day care facilities without extensive investigation. The comments were general and did not specify an AOC.

3.2 INTEGRATION OF COMMENTS

As these comments only concurred with the selected remedies identified, integration of the comments was not warranted.

3.3 COMMENT RESOLUTION

Please refer to the following pages for USEPA and IDEM comments and resolutions. Note that ‘Draft’ comments were addressed in working meetings, by teleconference or in revised documents. A formal written response was not provided for these comments.

RECORD OF USEPA AND IDEM

COMMENTS AND RESOLUTIONS

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
We make Indiana a cleaner, healthier place to live

Frank O'Bannon
Governor

John M. Hamilton
Commissioner

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P.O. Box 6015
Indianapolis, Indiana 46206-6015
(317) 232-8603
(800) 451-6027
www.ai.org/idem

November 17, 1998

Mr. Carl Loop
SOUTHDIV NAVFACENGCOM
2155 Eagle Drive
North Charleston, SC 29419-9010

Dear Mr. Loop:

Re: IDEM staff comments regarding the Proposed Plans (PPs) for AOCs 1, 5, 6, 7, 8, 9, 15, 17, and 18

Staff of the Indiana Department of Environmental Management have reviewed the above referenced documents. Our review generated the following comments:

GENERAL COMMENTS:

Section 7.0 - Community Participation:
In paragraph 2, the third sentence should read: "The Proposed Plan meets the applicable or relevant and appropriate federal and state requirements." In addition, this section should explain how public comments will be addressed. Please verify if a copy of the administrative record is available at the Warren Branch Library. If this is not the case, delete the statement in the last paragraph of this section.

SPECIFIC COMMENTS:

AOC 5:

Section 2.2 - Site History:
The entire sanitary sewer line will be transferred. However, the sewer lines, and the land around the sewer lines (easement), is transferable if the sewer line is within the transfer parcel 1. Clarification in the text is needed.

Figure 2-2:
The hatched areas on the map represent the transferable soils around some parts of the sewer system. However, the legend on the figure does not reflect that. A statement explaining that fact is needed in the text of the PP.

AOC 7:

Section 2.2 - Site History:
The entire sanitary sewer line will be transferred. However, the sewer lines, and the land around the sewer lines (easement) is transferable if the sewer line is within the transfer parcel 1. Clarification in the text is needed.

Figure 2-2:
The hatched areas on the map represent the transferable soils around some parts of the sewer system. However, the legend on the figure does not reflect that. A statement explaining that fact is needed in the text of the PP.

CONCLUSION:

It is IDEM staff's understanding that Institutional Control Plans (ICPs) will be attached to the Proposed Plans/Decision Documents. Once these ICPs are approved by IDEM and the U.S. EPA, IDEM staff will issue concurrence with the subject PPs. If you have any questions regarding the above comments, please contact me at (317) 308-3133.

Sincerely,

Gabriele Hauer, Project Manager
Defense Environmental Restoration Program
Office of Environmental Response

GHH:mg
cc: Rex Osborn, DERP, IDEM
Denise Boone, U.S. EPA Region V
Mark Sladic, Tetra Tech NUS
Joe Logan, Tetra Tech NUS
Alan Shoultz, Navy-Southdiv.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF

SRF-5J

December 1, 1998

Carl Loop
Department of the Navy
SOUTHDIV NAVFACENGCOM
Code 18E2BM
2155 Eagle Drive
Post Office Box 190010
North Charleston, SC 29419-9010

RE: Proposed Plans for Areas of Concern 1, 5, 6, 7, 8, 9, 15, 17 and 18 for the Naval Air Warfare Center, Indianapolis, Indiana.

Dear Mr. Loop:

The United States Environmental Protection Agency (USEPA) has reviewed the Proposed Plans for Areas of Concern (AOCs) 1, 5, 6, 7, 8, 9, 15, 17 and 18 for the Naval Air Warfare Center (NAWC), Indianapolis, Indiana. The preferred alternatives that the Navy has chosen for each of the AOCs are acceptable. However, the Navy must realize that there are costs associated with institutional controls (ICs) that are deed restrictions. The Navy must include an estimate of the costs for ICs.

The USEPA will not concur until the following are completed: the community acceptance of the preferred alternative, the Institutional Control Plan(s), and the finalized decision documents.

If the Navy as the lead agency reevaluates their preferred alternative for the AOCs, changes a component of the preferred remedy, or chooses to implement a remedy other than the preferred alternative, any such changes must be made in accordance with CERCLA Section 117(b).

If you have any questions concerning this letter, please feel free to contact me at (312) 886-6217.

Sincerely,

Denise Boone

Denise Boone
Remedial Project Manager

cc: Gabriele Hauer, IDEM

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PITT 03-9-043

March 5, 1999

Project Number 7173

Department of the Navy
SOUTHNAVFACENGCOM
ATTN: Carl Loop (Code 1871)
2155 Eagle Drive
North Charleston, South Carolina 29406

Reference: CLEAN Contract Number N62467-94-D-0888
Contract Task Order 0012

Subject: Decision Documents for AOC 1
Naval Air Warfare Center Indianapolis

Dear Mr. Loop:

In accordance with your request, please find enclosed three copies of the finalized Decision Document for AOC 1. The second part of the AOC 1 Decision Document submittal is the Institutional Control Manual and ICP for AOC 1. We believe the ICM is compliant with the most recent information provided by U.S. EPA. Upon regulatory concurrence, it is the Navy's intent to proceed as quickly as possible to complete the Decision Documents for the other AOCs in Parcel 1. These include AOCs 5, 6, 7, 8, 9, 15, 17, and 18.

Additionally, please see responses to IDEM comments. EPA said in a December 1, 1998 letter that they would not provide comments prior to community acceptance, completion of an ICP and finalized DD. The Navy feels these conditions have now all been met.

If you have any questions, feel free to call me at (412) 921-8216.

Sincerely,

Mark Sladic, P.E.
Task Order Manager

MS/gp

Enclosures

cc: Gabriele Hauer, IDEM
Denise Boone, USEPA
Alan Shoultz (w/o enclosures)
File 7173

IDEM COMMENTS REGARDING PROPOSED PLANS (PPs) FOR AOCs 1,5,6,7,8, 9, 15, 17, and 18

GENERAL COMMENTS:

1. **COMMENT:** **Section 7.0 – Community Participation**: In paragraph 2, the third sentence should read: "The Proposed Plan meets the applicable or relevant and appropriate federal and state requirements." In addition, this section should explain how public comments will be addressed. Please verify if a copy of the administrative record is available at the Warren Branch Library. If this is not the case, delete the statement in the last paragraph of this section.

   RESPONSE

a. The Navy agrees. This sentence in question some how got truncated and was missed. This will be corrected in the Decision Document.

b. A paragraph stating how the public comments will be addressed is located at the top of page 7-2. This is compliant with the EPA ROD guidance. No changes to the text are necessary.

c. A copy of the Administrative Record is located in the Warren Branch Library.

SPECIFIC COMMENTS:

AOC5:

1. **COMMENT:** **Section 2.2 – Site History:** The entire sanitary sewer line will be transferred. However, the sewer lines, and the land around the sewer lines (easement), is transferable if the sewer line is within the transfer parcel 1. Clarification in the text is needed.

   RESPONSE: The Navy agrees. This paragraph will be re-written to clarify this issue in the Decision Document.

2. **COMMENT Figure 2.2.** The hatched areas on the map represent the transferable soils around some parts of the sewer system. However, the legend on the figure does not reflect that. A statement explaining that fact is needed in the text of the PP.

   RESPONSE: The Navy agrees. A statement will be added to the text to explain the hatched areas on Figure 2-2. This change will be reflected in the Decision Document.

AOC 7:

1. **COMMENT:** **Section 2.2 – Site History:** The entire sanitary sewer line will be transferred. However, the sewer lines and the land around the sewer lines (easement) is transferable if the sewer line is within the transfer parcel 1. Clarification in the text is needed.

   RESPONSE: The Navy Agrees. This paragraph will be re-written to clarify this issue in the Decision Document.

2. **COMMENT:** **Figure 2-2:** The hatched areas on the map represent the transferable soils around some parts of the sewer system. However, the legend on the figure does not reflect that. A statement explaining that fact is needed in the text of the PP.

   RESPONSE: The Navy agrees. A statement will be added to the text to explain the hatched areas on Figure 2-2. This change will be reflected in the Decision Document.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF

SRF-5J

July 26, 1999

Carl Loop
Department of the Navy
SOUTHDIV NAVFACENGCOM
Code 18E2BM
2155 Eagle Drive
Post Office Box 190010
North Charleston, SC 29419-9010

RE: Decision Documents for Areas of Concern #5, 7, 9, 15 ,17, and 18 for the Naval Air Warfare Center, Indianapolis, Indiana.

Dear Mr. Loop:

The United States Environmental Protection Agency (USEPA) has reviewed the Decision Documents (DDs) for Areas of Concern (AOCs):

#5 - Transferable Portion of North-South Sanitary Sewer
#7 - Transferable Portion of East-West Storm Sewer
#9 - Northwest Corner of Building 3000
#15 - Building 1100
#17 -Transferable Portion of Sentry Drive
#18 - Northeast Land Scar Area

The DDs were received on July 7, 1999. The remedies that the Navy has selected are acceptable, however, the Navy has not provided the AOC-specific Institutional Control Plan (ICPs) as requested. In the USEPA's response to the proposed plans (dated December 1, 1998), it clearly stated that the USEPA could not concur until the following were completed: the community acceptance of the preferred alternative, the Institutional Control Plan(s), and the finalized decision documents. Two of the requirements have been satisfied.

Institutional controls must be clearly identified and defined, and their purpose and method of implementation should be clearly set forth in the decision document by way of the ICP as stated in the proposed plans. It is important to note that generally referring to or identifying an institutional control in a DD is not in itself an institutional control, because an institutional control must be implemented in order to achieve its objective, just as an engineering remedy described in a DD is

then designed and constructed. Additionally, the ICP must be included in the administrative record. The ICP Manual is not a substitute for the ICP, because the manual is only for the future property owner. The manual was developed so that the future property owner could have the ICPs in their possession without having to request access to the administrative record. The BRAC Closure Team agreed that all of abovementioned DDs were to follow the same format as the DD for AOC #1- Former Plating Area, Building 1000.

In Section 3.0 - Responsiveness Summary, please include a copy of the USEPA's and the Indiana Department of Environmental Management's (IDEM) comments on the proposed plan/DD and the Navy's responses to the comments in the next revision.

Please note that this is not a concurrence. The above deficiencies must be addressed before we can give a concurrence.

If you have any questions concerning this letter, please feel free to contact me at (312) 886-6217.

Sincerely,

Denise Boone

Denise Boone
Remedial Project Manager

cc: Sean Grady, IDEM
Alan Shoultz, SOUTHDIV
Mark Sladic, TtNUS

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PITT 07-9-201

July 27, 1999

Project Number 7173

Department of the Navy
SOUTHNAVFACENGCOM
ATTN: Carl Loop (Code 1871)
2155 Eagle Drive
North Charleston, South Carolina 29406

Reference: CLEAN Contract Number N62467-94-D-0888
Contract Task Order 0012

Subject: Decision Documents for Parcel 1
Naval Air Warfare Center Indianapolis

Dear Mr. Loop:

Please find enclosed three copies of change pages for the Parcel 1 AOCs.

1. **Instructions for the material attached to this letter:** At the recent BCT meeting, Sean pointed out that the Parcel 1 Decision Documents (DD) submitted on July 2 are lacking the site specific Institutional Control Plans. These DDs were to be revised in the same format as the signed AOC 1 DD. The AOC 1 DD has three appendices. The first is the local groundwater flow map. This map is not relevant for the other Parcel 1 DDs, and so is correctly excluded (since there is no groundwater remedy associated with these other AOCs). The second appendix for AOC 1 is the site-specific analytical summary, from the remedial investigation. The third appendix for AOC 1 is the site-specific Institutional Control Plan (ICP). It is this third appendix that has been inadvertently excluded. (However, the ICPs have been available in the Institutional Contol Manual for Parcel 1 which accompanied the Parcel 1 DD volume).

   Therefore, we are sending to the same distribution, which received the original DDs, a revised table of contents (TOC) identifying the appendix, plus the content of the missing appendix (the ICP). Please replace the TOC in each DD, and add the appendix contents to the end of each DD.

2. **Navy plan for packaging the appropriate DDs to support the initial parcel transfer:** Note that the parcel delineated for initial transfer is being identified as Parcel 1A, and contains only a subset of the AOCs included in the Parcel 1 documents. Upon regulatory concurrence and signature of the DDs included in the book titled '*Parcel 1 Decision Documents*', the DDs for the following AOCs will be copied from that book and collected in a separate volume titled '*Parcel 1A Decision Documents*'. These include:

   - AOC 5 - transferable portion of north-south sanitary sewer
   - AOC 7 - transferable portion of east-west storm sewer
   - AOC 17- transferable portion of sentry drive
   - AOC 18 - northeast land scar area

At the same time, the Institutional Control Manual for Parcel 1A will be prepared, using just the individual ICPs for the four AOCs identified above. These ICPs have already been submitted for regulatory review in the July 2 submittal of the ' *Parcel 1 Institutional Control Manual*.'

If you have any questions, feel free to call me at (412) 921-8216.

Sincerely,

Mark Sladic, P.E.
Task Order Manager

MS/kf

Enclosures

cc: Sean Grady, IDEM (w/enclosure)
Gary Schafer, USEPA (w/enclosure)
Alan Shoultz (w/o enclosures)
Mark Perry, TtNUS (w/enclosure)
Debra Wroblewski/DER, TtNUS (w/o enclosures)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF

SRF-5J

July 28, 1999

Carl Loop
Department of the Navy
SOUTHDIV NAVFACENGCOM
Code 18E2BM
2155 Eagle Drive
Post Office Box 190010
North Charleston, SC 29419-9010

RE: Decision Documents for Areas of Concern #5, 7, 9, 15, 17, and 18 for the Naval Air Warfare Center, Indianapolis, Indiana.

Dear Mr. Loop:

The United States Environmental Protection Agency (USEPA) has reviewed the Decision Documents (DDs) for Areas of Concern (AOCs):

5 - Transferable Portion of North-South Sanitary Sewer
7 - Transferable Portion of East-West Storm Sewer
9 - Northwest Corner of Building 3000
#15 - Building 1100
#17 -Transferable Portion of Sentry Drive
#18 - Northeast Land Scar Area

The revised pages were received on July 28, 1999. The USEPA concurs with remedies that the Navy has selected. However, in Section 3.0 - Responsiveness Summary, please include a copy of the USEPA's and the Indiana Department of Environmental Management's (IDEM) comments on the proposed plan/DD and the Navy's responses to the comments.

If you have any questions concerning this letter, please feel free to contact me at (312) 886-6217.

Sincerely,

Denise Boone

Denise Boone
Remedial Project Manager

cc: Sean Grady, IDEM
Alan Shoultz, SOUTHDIV
Mark Sladic, TtNUS

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PITT 08-9-050

August 6, 1999

Project Number 7173

Department of the Navy
SOUTHNAVFACENGCOM
ATTN: Carl Loop (Code 1871)
2155 Eagle Drive
North Charleston, South Carolina 29406

Reference: CLEAN Contract Number N62467-94-D-0888
Contract Task Order 0012

Subject: Decision Documents for Parcel 1
Naval Air Warfare Center Indianapolis

Dear Mr. Loop:

Please find enclosed three copies of change pages for the Parcel 1 AOCs.

1. **Instructions for the material attached to this letter**: Pursuant to their letter dated July 28, regarding the Decision Documents for this site, the EPA has requested that a copy of the USEPA's and the Indiana Department of Environmental Management's (IDEM) comments on the proposed plan/DD and the Navy's responses to the comments be included with these documents. Therefore, please replace the following pages:

    - The updated table of contents (identifying Section 3.3 Comment Resolution), and,
    - Page 3-1

    Following Page 3-1, please insert the pages following the title page 'USEPA and IDEM Comments and Resolutions.' Note that the content of each group is identical, however the contents page and page 3-1 contain a header in the upper right corner which indicate which section the change pages should be inserted in.

    As the remedy for AOC 6 and AOC 8 are 'no further action', these AOCs do not have change pages. This is consistent with EPA's July 28 letter.

2. **Schedule**: The Navy believes that the absence of these comment letters has not presented a material hurdle to completion of the regulatory review for these documents. The team schedule specified that following a 30-day regulatory review period, the date of concurrence on the Decision Documents was to be August 5. The Navy would appreciate if the EPA can now remove the signature pages from one set of the Decision Documents and sign these in the appropriate locations. Afterwards, please forward

these to the IDEM for signature. Following IDEM signature, the Navy requests that IDEM please forward them to Southdiv, attention Carl Loop, for final signature. When Southdiv returns the signed pages to us we will provide copies for inclusion in all outstanding sets of Decision Documents.

If you have any questions, feel free to call me at (412) 921-8216.

Sincerely,

Mark Sladic, P.E.
Task Order Manager

MS/kf

Enclosures

cc: Sean Grady, IDEM (w/enclosure)
Gary Schafer, USEPA (w/enclosure)
Alan Shoultz (w/o enclosures)
Mark Perry, TtNUS (w/enclosure)
Debra Wroblewski/DER, TtNUS (w/o enclosures)

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August 17, 1999

Mr. Carl Loop
Department of the Navy
SOUTHDIV NAVFACENGCOM
Code 18E2BM
2155 Eagle Drive
Post Office Box 190010
North Charleston, SC 29419-9010

Dear Mr. Loop:

Re: Decision Document for Areas of Concern #5, 6, 7, 8, 9, 15, 17, and 18 for the Naval Air Warfare Center, Indianapolis, Indiana

Staff of the Indiana Department of Environmental Management (IDEM) have reviewed the above referenced document and has determined that it is acceptable providing the Navy address the following comments:

GENERAL COMMENT

An executive summary should be incorporated to give the readers an understanding of what this document is and why it was developed. Also, the title of this report should be changed to more accurately reflect the parcel name.

SPECIFIC COMMENTS

AOC 6, Page 2-13, Section 2.9: Some language in this section is not needed. Since there was no contamination, no risk, and no action is required for this AOC, the second sentence in the first paragraph continuing through the end of the page should be removed. Revision of this section may be needed.

AOC 8, Page 2-13, Section 2.9: Again, some language in this section is not needed. Since there was no contamination, no risk, and no action is required for this AOC, the third sentence in the first paragraph continuing through the end of the page should be removed. Revision of this section may be needed.

If you have any questions concerning this letter, please feel free to contact me at (317) 308-3121.

Sincerely,

Sean K. Grady, Project Manager
Federal Programs Section
Office of Environmental Response

SKG:mg
cc: Alan Shoultz, SOUTHDIV
Mark Sladic, Tetra Tech NUS
Denise Boone, U.S. EPA

REFERENCES

B&R Environmental, March 1996, Environmental Baseline Survey - Naval Air Warfare Center Indianapolis, Indiana.

B&R Environmental, June 1996. Community Relations Plan - Naval Air Warfare Center Indianapolis, Indiana.

B&R Environmental, August 1996. Finding of Suitability to Lease and Environmental Baseline Survey for Lease - Naval Air Warfare Center Indianapolis, Indiana.

B&R Environmental, October 1996. Remedial Investigation Work Plan - Naval Air Warfare Center Indianapolis, Indiana.

Supporting documents: Field Sampling Plan
Health and Safety Plan
Quality Assurance Project Plan

B&R Environmental, November 1996. DRAFT Data Management Plan - Naval Air Warfare Center Indianapolis, Indiana.

B&R Environmental, November 1997. Phase I Remedial Investigation Report - Revision 1 - Naval Air Warfare Center Indianapolis, Indiana

IDEM (Indiana Department of Environmental Management), October 1995. Voluntary Remediation Program Resource Guide. Office of Environmental Response.

Tetra Tech NUS, Inc., August 7, 1998, Technical Memorandum of Phase II Remedial Investigation Analyses.

Tetra Tech NUS, Inc., September 1998, Proposed Plan for AOC 18 – Northeast Land Scar Area - Naval Air Warfare Center Indianapolis, Indiana.

Tetra Tech NUS, Inc., November 1998, Phase I and II Remedial Investigation Report - Revision 2 - Naval Air Warfare Center Indianapolis, Indiana.

U.S. EPA (United States Environmental Protection Agency), 1989. Guidance on Preparing Superfund Decision Documents - Interim Final. EPA/540/G-89/007. Office of Emergency and Remedial Response, Washington D.C.

U.S. EPA (United States Environmental Protection Agency), 1990. National Contingency Plan. Federal Register Vol. 55 No. 46 pp. 8666-8865.

U.S. Geological Survey, 1997, Hydrogeology and Ground-Water Flow in the Vicinity of the Naval Air Warfare Center, Indianapolis, Indiana., Risch, M. R. and R. F. Duwelius, U.S. Department of the Interior, U.S. Geological Survey, Indianapolis, Indiana, Final Report.

U.S. Geological Survey, 1998, Hydrogeology, Ground-Water Quality, Ground-Water flow at the Naval Air Warfare Center, Indianapolis, Indiana., Risch, M. R., U.S. Department of the Interior, U.S. Geological Survey, Indianapolis, Indiana, Draft Report.

AOC 18

APPENDIX A

REMEDIAL INVESTIGATION REPORT LABORATORY DATA, RISK ASSESSMENT TABLES AND SAMPLE LOCATION FIGURE

TABLE 8-59
SUMMARY OF POSITIVE DETECTIONS IN SURFACE AND SUBSURFACE SOIL
AOC 18 - THE NORTHEAST LAND SCAR AREA
NAVAL AIR WAREFARE CENTER INDIANAPOLIS
MARION COUNTY, INDIANA

SAMPLE NUMBER:	BACKGROUND	A18DP00101	A18DP00102	A18DP00201	A18DP00202	A18DP00301	A18DP00302	A18DP00303	A18DP00401	A18DP00402
SAMPLE DATE:		11/11/96	11/11/96	11/11/96	11/11/96	11/11/96	11/11/96	11/11/96	11/11/96	11/11/96
PHASE:		I	I	I	I	I	I	I	I	I
BORING:		AOC18DP01	AOC18DP01	AOC18DP02	AOC18DP02	AOC18DP03	AOC18DP03	AOC18DP03	AOC18DP04	AOC18DP04
AOC:		A18	A18	A18	A18	A18	A18	A18	A18	A18
DEPTH:		0 - 2	2 - 6	0 - 2	2 - 6	0 - 2	2 - 6	6 - 10	0 - 2	2 - 6
FIELD DUPLICATE OF:										
SEMIVOLATILES (µg/kg)										
BIS(2-ETHYLHEXYL)PHTHALATE						83 J	440 U	390 U		
DI-N-BUTYL PHTHALATE						40 J	440 U	390 U		
METALS (mg/kg)										
ALUMINUM	22217					13700 J	11100 J	7890 J		
ANTIMONY	NA					0.48 *	0.58 *	0.82 J*		
ARSENIC	21.3					6.9	15.1	20.1		
BARIUM	222					145 J	146 J	72.1 J		
BERYLLIUM	1.13					0.67	0.63	0.4		
CADMIUM	NA					0.72 U	0.24 *	0.37 J*		
CALCIUM	914377					5600 J	3590 J	96800 J		
CHROMIUM	27.1					17.8 J	17.1	15.4 J		
COBALT	22.5					8.1 J	5.4 U	7.5 J		
COPPER	30.3					15.1 J	20.3	20.5		
IRON	30170					18200 J	22300 J	16300 J		
LEAD	61.7					17 J	11.3 J	9.1 J		
MAGNESIUM	157362					2830 J	3050	30600		
MANGANESE	2130					781 J	201 J	214 J		
NICKEL	108					14.7	17.3	17.9		
POTASSIUM	1832					996 J	890	2060 *		
SELENIUM	1.11					0.96 U	0.38	0.47 UJ		
SILVER	5.46					1.4 U	0.9	2 J		
SODIUM	120					247 J*	201 J*	257 J*		
THALLIUM	2.71					1.8	1.9	0.47 UJ		
TIN	NA					9.6 U	8.7 *	9.3 U		
VANADIUM	51.3					34.2 J	32.3	29.1		
ZINC	113					55.7 J	56.5	56.8		

Background value for inorganics are the 95% Upper Tolerance Limit (UTL) which is based on the background data set.
*** - Indicates the concentration exceeds background.**
Blank space indicates sample not analyzed for that particular compound.

TABLE 8-59
SUMMARY OF POSITIVE DETECTIONS IN SURFACE AND SUBSURFACE SOIL
AOC 18 - THE NORTHEAST LAND SCAR AREA
NAVAL AIR WAREFARE CENTER INDIANAPOLIS
MARION COUNTY, INDIANA

SAMPLE NUMBER:	BACKGROUND	A18DP00501	A18DP00502							
SAMPLE DATE:		11/11/96	11/11/96							
PHASE:		I	I							
BORING:		AOC18DP05	AOC18DP05							
AOC:		A18	A18							
DEPTH:		0 - 2	2 - 6							
FIELD DUPLICATE OF:										
SEMIVOLATILES (µg/kg)										
BIS(2-ETHYLHEXYL)PHTHALATE										
DI-N-BUTYL PHTHALATE										
METALS (mg/kg)										
ALUMINUM	22217									
ANTIMONY	NA									
ARSENIC	21.3									
BARIUM	222									
BERYLLIUM	1.13									
CADMIUM	NA									
CALCIUM	914377									
CHROMIUM	27.1									
COBALT	22.5									
COPPER	30.3									
IRON	30170									
LEAD	61.7									
MAGNESIUM	157362									
MANGANESE	2130									
NICKEL	108									
POTASSIUM	1832									
SELENIUM	1.11									
SILVER	5.46									
SODIUM	120									
THALLIUM	2.71									
TIN	NA									
VANADIUM	51.3									
ZINC	113									

Background value for inorganics are the 95% Upper Tolerance Limit (UTL) which is based on the background data set.
*** - Indicates the concentration exceeds background.**
Blank space indicates sample not analyzed for that particular compound.

Data validation was conducted in accordance with the EPA National Functional Guidelines for Organic and Inorganic Data Review and EPA Region V guidelines. The following data qualifiers were used during the data review process:

- U - Indicates that the analyte was not detected at the numerical detection limit. Nondetected results reported by the laboratory and positive results qualified due to laboratory or field blank contamination (false positives) are reported using this qualifier.

- BU - Indicates that the analyte was detected in the associated method blank but the result is considered to be a false positive as a result of method blank contamination.

- BJ – Indicates that the analyte was detected in the associated laboratory method blank. The stated result is qualified as estimated since the concentration exceeds the validation blank action level.

- UJ - Indicates that the analyte was not detected. However, the detection limit is estimated as a result of a noncompliance encountered during laboratory analysis. The associated detection limit is regarded as imprecise.

- J - Indicates that the analyte was detected and the associated numerical result is estimated or imprecise.

- UR - Indicates that the laboratory did not detect the analyte. However, the nondetected analyte is considered unreliable and unusable as a result of a gross technical deficiency.

- R - Indicates that the laboratory detected the analyte. However, the positive result is considered unreliable and unusable as a result of a gross technical deficiency.

The above qualifications are generally categorized as major and minor problems or deficiencies. Major problems are defined as those which result in the rejection of a data. Such results are qualified either as R or UR. Minor problems are defined as those, which result in the estimation of a given data point. The following qualifiers identify data qualified as a consequence of minor problems: BU, BJ, UJ, and J.

TABLE 8-61

SELECTION OF COPCs FOR HUMAN HEALTH RISK ASSESSMENT
DIRECT CONTACT EXPOSURE - RESIDENTIAL LAND USE SCENARIO
AOC 18 - NORTHEAST LAND SCAR AREA - SURFACE SOIL
PHASE I & II REMEDIAL INVESTIGATION
NAVAL AIR WARFARE CENTER INDIANAPOLIS
MARION COUNTY, INDIANA

Chemical	Frequency of Detection (1)	Range of Detection	Exposure Point Concentration	Average Concentrations Positive Hits	Location of Maximum	EPA Region III Risk-Based Concentrations (2) Residential	EPA Region IX Preliminary Risk-Based Goals (3) Residential	Indiana Tier II Cleanup Goals (4) Residential	Soil Screening Level (5) Soil to Air	Upper Tolerance Limit for Background	Selected as a COPC? Residential Yes or No	Rationale for Contaminant Deletion or Selection (6)
Semivolatile Organic Compounds (ug/kg)												
Bis(2-Ethylhexyl)phthalate	1/1	83	83	83	A0C18DP03	46000	32000	45710	210000	ND	No	BSL
Di-n-butyl phthalate	1/1	40	40	40	A0C18DP03	780000	680000	5400000	100000	ND	No	BSL
Metals (mg/kg)												
Aluminum	1/1	13700	13700	13700	A0C18DP03			—	—	22217	No	BKG
Antimony	1/1	0.48	0.48	0.48	A0C18DP03	3.1	3	108	—		No	BSL
Arsenic	1/1	6.9	6.9	6.9	A0C18DP03			61	380	21.3	No	BKG
Barium	1/1	145	145	145	A0C18DP03	550	520	10950	350000	222	No	BSL, BKG
Beryllium	1/1	0.67	0.67	0.67	A0C18DP03	15	0.14		680	1.13	No	BKG
Calcium	1/1	5600	5600	5600	A0C18DP03	—	—	—	—	914377	No	NUT, BKG
Chromium (Total)	1/1	17.8	17.8	17.8	A0C18DP03	120000 (7)	210	—	—	27.1	No	BSL, BKG
Cobalt	1/1	8.1	8.1	8.1	A0C18DP03	470	330	—	—	22.8	No	BSL, BKG
Copper	1/1	15.1	15.1	15.1	A0C18DP03	310	280	—	—	30.3	No	BSL, BKG
Iron	1/1	18200	18200	18200	A0C18DP03	2300	2200	—	—	30170	No	NUT,BSL, BKG
Lead	1/1	17	17	17	A0C18DP03	400 (8)	400	—	—	61.7	No	BSL, BKG
Magnesium	1/1	2830	2830	2830	A0C18DP03	—	—	—	—	157382	No	NUT, BKG
Manganese	1/1	781	781	781	A0C18DP03	180	310	—	—	2130	No	BKG
Nickel	1/1	14.7	14.7	14.7	A0C18DP03			5400	6800	108	No	BSL, BKG
Potassium	1/1	996	996	996	A0C18DP03	—	—	—	—	1632	No	NUT, BKG
Sodium	1/1	247	247	247	A0C18DP03	—	—	—	—		No	NUT
Thallium	1/1	1.8	1.8	1.8	A0C18DP03	5.5	5.2	—	—	2.71	No	BSL, BKG
Vanadium	1/1	34.2	34.2	34.2	A0C18DP03	55	52	1960	—	61.3	No	BSL, BKG
Zinc	1/1	55.7	55.7	55.7	A0C18DP03	2300	2200	10000	—	113	No	BSL, BKG

NOTES:
(1) - Data from the following sampling locations were included in the screening process: A18DP00101, A18DP00201, A18DP00301, A18DP00401, A18DP00501
(2) - U.S. EPA Region III Risk-based Concentration Table, April 12, 1999.
(3) - U.S. EPA Region IX Preliminary Remedial Goals, May 1, 1998.
(4) - IDEM Voluntary Remediation Program Resource Guide, October, 1995.
(5) - U.S. EPA Soil Screening Guidance, May 1996.
(6) - Rationale Codes Above Screening Levels (ASL)
Background Level (BKG)
Essential Nutrient (NUT)
Below Screening Level (BSL)
(7) - Value is for trivalent chromium.
(8) - OSWER screening level.
One-tenth the EPA Region III RBCs and EPA Region IX PRGs are presented for nocarcinogenic compounds.
Shaded bolded values indicate an exceedance of background end and / or criteria.
ND - Not Detected
COPC - Chemicals of Potential Concern.

TABLE 8-62

SELECTION OF COPCs FOR HUMAN HEALTH RISK ASSESSMENT
DIRECT CONTACT EXPOSURE - NON RESIDENTIAL LAND USE SCENARIO
AOC 18 - NORTHEAST LAND SCAR AREA - SURFACE SOIL
PHASE I & II REMEDIAL INVESTIGATION
NAVAL AIR WARFARE CENTER INDIANAPOLIS
MARION COUNTY, INDIANA

Chemical	Frequency of Detection (1)	Range of Detection	Exposure Point Concentration	Average Concentrations Positive Hits	Location of Maximum	EPA Region III Risk-Based Concentrations (2) Non Residential	EPA Region IX Preliminary Risk-Based Goals (3) Non Residential	Indiana Tier II Cleanup Goals (4) Non Residential	Soil Screening Level (5) Soil to Air	Upper Tolerance Limit for Background	Selected as a COPC? Non Residential Yes or No	Rationale for Contaminant Deletion or Selection (6)
Semivolatile Organic Compounds (ug/kg)												
Bis(2-Ethylhexyl)phthalate	1/1	83	83	83	AOC18DP03	410000	210000	4142860	210000	ND	No	BSL
Di-n-butyl phthalate	1/1	40	40	40	AOC18DP03	20500000	1100000	10285000	100000	ND	No	BSL
Metals (mg/kg)												
Aluminum	1/1	13700	13700	13700	AOC18DP03	200000	100000 (max)	—	—	22217	No	BSL, BKG
Antimony	1/1	0.46	0.46	0.46	AOC18DP03	82	75	616	—	1.1	No	BSL
Arsenic	1/1	6.9	6.9	6.9	AOC18DP03	[redacted]	[redacted]	612	390	21.3	No	BSL, BKG
Barium	1/1	148	148	148	AOC18DP03	14000	100000 (max)	10000	350000	222	No	BSL, BKG
Beryllium	1/1	0.67	0.67	0.67	AOC18DP03	1.4	1.2	13.49	690	1.13	No	BSL, BKG
Calcium	1/1	5600	5600	5600	AOC18DP03	—	—	—	—	914577	No	NUT, BKG
Chromium (Total)	1/1	17.8	17.8	17.8	AOC18DP03	310000 (7)	450	—	—	37.1	No	BSL, BKG
Cobalt	1/1	8.1	8.1	8.1	AOC18DP03	12000	2900	—	—	22.6	No	BSL, BKG
Copper	1/1	15.1	15.1	15.1	AOC18DP03	8200	7050	—	—	30.8	No	BSL, BKG
Iron	1/1	18200	18200	18200	AOC18DP03	61000	100000 (max)	—	—	30170	No	NUT,BSL, BKG
Lead	1/1	17	17	17	AOC18DP03	—	1000	—	—	61.7	No	BSL, BKG
Magnesium	1/1	2830	2830	2830	AOC18DP03	—	—	—	—	157262	No	NUT, BKG
Manganese	1/1	781	781	781	AOC18DP03	4700	3850	—	—	2130	No	BSL, BKG
Nickel	1/1	14.7	14.7	14.7	AOC18DP03	4100	3780	10000	6950	106	No	BSL, BKG
Potassium	1/1	808	808	808	AOC18DP03	—	—	—	—	1832	No	NUT, BKG
Sodium	1/1	247	247	247	AOC18DP03	—	—	—	—	[redacted]	No	NUT
Thallium	1/1	1.8	1.8	1.8	AOC18DP03	140	130	—	—	2.71	No	BSL, BKG
Vanadium	1/1	34.2	34.2	34.2	AOC18DP03	1400	1300	10000	—	51.3	No	BSL, BKG
Zinc	1/1	55.7	55.7	55.7	AOC18DP03	61000	100000 (max)	10000	—	113	No	BSL, BKG

NOTES:
(1) - Data from the followings sampling locations were included in the screening process: A18DP00101, A18DP00201, A18DP00301, A18DP00401, A18DP00501
(2) - U.S. EPA Region-based Concentration Table, April 12, 1999.
(3) - U.S. EPA Region IX Preliminary Remedial Goals May 1, 1998.
(4) - IDEM Voluntary Remediation Program Resource Guide, October, 1995.
(5) - U.S. EPA Soil Screening Guidance, May 1996.
(6) - Rationale Codes
Above Screening Levels (ASL)
Background Levels (BKG)
Essential Nutrient (NUT)
Below Screening Level (BSL)
(7) - Value is for trivalent chromium.
One-tenth the EPA Region III RBCs and EPA Region IX PRGs are presented for noncarcinogenic compounds.
Shaded bolded values indicate an exceedance of background and / criteria.
ND - Not Detected
COPC - Chemicals of Potential Concern.
max - Ceiling limit.

TABLE 8-63

SELECTION OF COPCs FOR HUMAN HEALTH RISK ASSESSMENT
DIRECT CONTACT EXPOSURE - RESIDENTIAL LAND USE SCENARIO
AOC 18 - THE NORTHEAST LAND SCAR AREA - SUBSURFACE SOIL
NAVAL AIR WARFARE CENTER INDIANAPOLIS
PHASE I & II REMEDIAL INVESTIGATION
MARION COUNTY, INDIANA

Chemical	Frequency of Detection (1)	Range of Detection	Exposure Point Concentration	Average Concentration Positive Hits	Location of Maximum	EPA Region III Risk-Based Concentrations (2)	EPA Region IX Preliminary Risk-Based Goals (3)	Indiana Tier II Cleanup Goals (4)	Soil Screening Level (5)	Upper Tolerance Limit for Background	Selected as a COPC?	Rationale for Contaminant Deletion or Selection (6)
						Residential	Residential	Residential	Soil to Air		Residential Yes or No	
Metals (mg/kg)												
Aluminum	2/2	7890 - 11100	11100	9500	AOC18DP03	7800	7600	—	—	22217	No	BSL, BKG
Antimony	2/2	0.58 - 0.82	0.82	0.7	AOC18DP03	3.1	3.1	584	—	[illegible]	No	BSL
Arsenic	2/2	15.1 - 20.1	20.1	17.6	AOC18DP03	[illegible]	[illegible]	436	380	21.3	No	BKG
Barium	2/2	72.1 - 146	146	109	AOC18DP03	550	530	102200	350000	222	No	BSL, BKG
Beryllium	2/2	0.4 - 0.63	0.63	0.515	AOC18DP03	16	0.14	116.8	690	1.13	No	BSL, BKG
Cadmium	2/2	0.24 - 0.37	0.37	0.305	AOC18DP03	3.9	3.7	755	920	[illegible]	No	BSL
Calcium	2/2	[illegible]	[illegible]	[illegible]	AOC18DP04	—	—	—	—	[illegible]	No	NUT, BKG
Chromium (Total)	2/2	15.4 - 17.1	17.1	16.3	AOC18DP03	12000 (7)	210	—	—	27.1	No	BSL, BKG
Cobalt	1/2	7.6	7.6	7.6	[illegible]	470	330	—	—	22.6	No	BSL, BKG
Copper	2/2	28.3 - 29.5	29.5	29.4	AOC18DP03	310	280	—	—	32.3	No	BSL, BKG
Iron	2/2	14500 - 22300	22300	18500	AOC18DP03	[illegible]	[illegible]	—	—	30170	No	NUT, BKG
Lead	2/2	8.1 - 11.3	11.3	10.2	AOC18DP04	400 (8)	400	—	—	27.7	No	BSL, BKG
Magnesium	2/2	3000 - 38800	38800	18800	AOC18DP04	—	—	—	—	157352	No	BSL, BKG
Manganese	2/2	204 - 214	214	209	AOC18DP03	[illegible]	310	—	—	2330	No	BKG
Nickel	2/2	17.3 - 17.5	17.5	17.4	AOC18DP03	160	150	29200	6000	104	No	BSL, BKG
Potassium	2/2	800 - 2000	2000	1400	AOC18DP03	—	—	—	—	[illegible]	No	NUT
Selenium	1/2	0.36	0.36	0.36	AOC18DP04	39	37	7300	—	1.11	No	BSL, BKG
Silver	2/2	0.9 - 2	2	1.45	AOC18DP03	39	37	7300	—	3.46	No	BSL, BKG
Sodium	2/2	201 - 257	257	229	AOC18DP04	—	—	—	—	[illegible]	No	NUT
Thallium	1/2	1.9	1.9	1.9	AOC18DP04	0.6	0.6	—	—	2.71	No	BSL, BKG
Tin	1/2	8.7	8.7	8.7	AOC18DP03	4700	4600	—	—	[illegible]	No	BSL
Vanadium	2/2	29.1 - 32.3	32.3	30.7	AOC18DP04	55	55	10220	—	51.3	No	BSL, BKG
Zinc	2/2	55.5 - 56.8	56.8	55.7	AOC18DP03	2300	2300	438000	—	113	No	BSL, BKG

NOTES:
(1) - Data from the following sampling locations were included in the screening process: A18DP00102, A18DP00202, A18DP00302, A18DP00402, A18DP00502
(2) - U.S. EPA Region III Risk-based Concentration Table, April 12, 1999.
(3) - U.S. EPA Region IX Preliminary Remedial Goals, May 1, 1998.
(4) - IDEM Voluntary Remediation Program Resource Guide, October, 1995.
(5) - U.S. EPA Soil Screening Guidance, May 1996.
(6) - Rationale Codes Above Screening Levels (ASL)
Background Level (BKG)
Essential Nutrient (NUT)
Below Screening Level (BSL)
(7) - Value is for trivalent chromium.
(8) - OSWER screening level.
One-tenth the EPA Region III RBCs and EPA Region IX PRGs are presented for noncarcinogen compounds.
Shaded bolded values indicate an exceedance of background end and / or criteria.
ND - Not Detected
COPC - Chemicals of Potential Concern.

TABLE 8-64

SELECTION OF COPCs FOR HUMAN HEALTH RISK ASSESSMENT
DIRECT CONTACT EXPOSURE - NON RESIDENTIAL LAND USE SCENARIO
AOC 18 - THE NORTH EAST LAND SCAR AREA - SUBSURFACE SOIL
NAVAL AIR WARFARE CENTER INDIANAPOLIS
PHASE I & II REMEDIAL INVESTIGATION
MARION COUNTY, INDIANA

Chemical	Frequency of Detection (1)	Range of Detection	Exposure Point Concentration	Average Concentrations Positive Hits	Location of Maximum	EPA Region III Risk-Based Concentrations (2) Non Residential	EPA Region IX Preliminary Risk-Based Goals (3) Non Residential	Indiana Tier II Closure Goals (4) Non Residential	Soil Screening Level (5) Soil to Air	Upper Tolerance Limit for Background	Selected as a COPC? Non Residential Yes or No	Rationale for Contaminant Deletion or Selection (6)
Metals (mg/kg)												
Aluminum	2/2	7690 - 11100	11100	9395	AOC18DP03	100000	100000 (max)	—	—	22217	No	BSL, BKG
Antimony	2/2	0.56 - 0.82	0.82	0.7	AOC18DP03	82	75	684	—	[redacted]	No	BSL
Arsenic	2/2	15.1 - 20.1	20.1	17.6	AOC18DP03	[redacted]	[redacted]	436	380	21.3	No	BKG
Barium	2/2	72.1 - 146	146	109	AOC18DP03	14000	100000 (max)	122500	350000	222	No	BSL, BKG
Beryllium	2/2	0.4 - 0.63	0.63	0.515	AOC18DP03	410	1.2	1116	880	1.13	No	BSL, BKG
Cadmium	2/2	0.24 - 0.37	0.37	0.305	AOC18DP03	100	75	730	920	[redacted]	No	BSL
Calcium	2/2	9580 - 95800	95800	60200	AOC18DP03	—	—	—	—	914377	No	NUT, BKG
Chromium (Total)	2/2	15.4 - 17.1	17.1	16.3	AOC18DP03	310000 (7)	450	—	—	27.1	No	BSL, BKG
Cobalt	1/2	7.5	7.5	7.5	AOC18DP03	12000	2900	—	—	22.6	No	BSL, BKG
Copper	2/2	20.5 - 20.5	20.5	20.4	AOC18DP03	8200	70000	—	—	30.3	No	BSL, BKG
Iron	2/2	16900 - 22500	22500	19700	AOC18DP03	61000	100000 (max)	—	—	39170	No	NUT, BSL, BKG
Lead	2/2	9.1 - 11.3	11.3	10.2	AOC18DP03	—	1000	—	—	61.7	No	BSL, BKG
Magnesium	2/2	3060 - 30600	30600	16800	AOC18DP03	—	—	—	—	157362	No	NUT, BKG
Manganese	2/2	201 - 214	214	208	AOC18DP03	4100	4800	—	—	2130	No	BSL, BKG
Nickel	2/2	17.3 - 17.8	17.8	17.6	AOC18DP03	4100	3700	20200	8900	198	No	BSL, BKG
Potassium	2/2	890 - 2080	2080	1480	AOC18DP03	—	—	—	—	[redacted]	No	NUT
Selenium	1/2	0.36	0.36	0.36	AOC18DP03	1000	840	7300	—	1.11	No	BSL, BKG
Silver	2/2	0.9 - 2	2	1.45	AOC18DP03	1000	840	7300	—	3.48	No	BSL, BKG
Sodium	2/2	251 - 257	257	229	AOC18DP03	—	—	—	—	[redacted]	No	NUT
Thallium	1/2	1.9	1.9	1.9	AOC18DP03	140	130	—	—	2.71	No	BSL, BKG
Tin	1/2	8.7	8.7	8.7	AOC18DP03	120000	100000 (max)	—	—	[redacted]	No	BSL
Vanadium	2/2	29.1 - 32.3	32.3	30.7	AOC18DP03	1400	1300	10220	—	51.3	No	BSL, BKG
Zinc	2/2	56.5 - 56.8	56.8	56.7	AOC18DP03	61000	100000 (max)	436000	—	113	No	BSL, BKG

Notes:
(1) - Date from the following sampling locations were included in the screening process: A18DP00102, A18DP00202, A18DP00302, A18DP00303, A18DP00402, A18DP00502
(2) - U.S. EPA Region III Risk-based Concentration Table, April 12, 1999.
(3) - U.S. EPA Region IX Preliminary Remedial Goals, May 1, 1998.
(4) - IDEM Voluntary Remediation Program Resource Guide, October, 1995
(5) - U.S. EPA Soil Screening Guidance, May 1996.
(6) - Rationale Codes Above Screening Levels (ASL)

TABLE 8-65

SELECTION OF COPCs FOR HUMAN HEALTH RISK ASSESSMENT
GROUNDWATER PROTECTION EVALUATION
AOC 18 - THE NORTHEAST LAND SCAR AREA - SURFACE AND SUBSURFACE SOIL
PHASE I & II REMEDIAL INVESTIGATION
NAVAL AIR WARFARE CENTER INDIANAPOLIS
MARION COUNTY, INDIANA

Chemical	Maximum Concentration (1)		Indiana Tier II Cleanup Goals (2)		EPA Region IX Soil Screening Level (3)	Upper Tolerance Limit for Background	Selected as a COPC?	
	Surface Soil	Subsurface Soil	Non Residential	Residential	Soil to Groundwater		Industrial Yes or No	Residential Yes or No
Volatile Organic Compounds (ug/kg)								
Bis(2-ethylhexyl)phthalate	53	ND	1406250	16427	3600000	ND	No	No
Di-n-butyl Phthalate	40	ND	6186560	1034967	2300000	ND	No	No
Metals (mg/kg)								
Aluminum	13700	11100	—	—	—	22217	NC	NC
Antimony	0.48	0.62	—	—	5	ND	No	No
Arsenic	6.9	20.1	—	—	29	21.3	No	No
Barium	145	146	—	—	1600	222	No	No
Beryllium	0.67	0.63	—	—	63	1.13	No	No
Cadmium	ND	0.37	—	—	8	ND	No	No
Calcium	5600	98500	—	—	—	914377	NC	NC
Chromium	17.9	17.1	—	—	38	27.1	No	No
Cobalt	8.1	7.5	—	—	—	22.5	NC	NC
Copper	15.1	20.5	—	—	—	30.3	NC	NC
Iron	16200	22300	—	—	—	30170	NC	NC
Lead	17	11.3	—	—	—	61.7	NC	NC
Magnesium	2830	39800	—	—	—	157362	NC	NC
Manganese	761	214	—	—	—	2139	NC	NC
Nickel	14.7	17.9	—	—	130	106	No	No
Potassium	998	2080	—	—	—	1832	NC	NC
Selenium	ND	0.35	—	—	5	1.11	No	No
Silver	ND	2	—	—	34	5.48	No	No
Sodium	247	257	—	—	—	120	NC	NC
Thallium	1.8	1.9	—	—	0.7	2.71	No	No
Tin	ND	5.7	—	—	—	ND	NC	NC
Vanadium	34.2	32.3	—	—	6000	51.3	No	No
Zinc	56.7	56.6	—	—	12000	113	No	No

NOTES:
(1) - Data from the following sampling locations were included in the screening process: A18DP00102, A18DP00202, A18DP00302, A18DP00303, A18DP00402, A18DP00502
(2) - IDEM Voluntary Remediation Program Resource Guide, October, 1995.
(3) - U.S. EPA Region IX Preliminary Remedial Goals, May 1, 1998.
Shaded bolded values indicate an exceedance of criteria.
ND - Not Detected
COPC - Chemicals of Potential Concern.
NC - No criteria available.

TABLE 8-66

TERRESTRIAL FLORA AND INVERTEBRATE FAUNA COPC SELECTION TABLES - AOC 18
PHASE II REMEDIAL INVESTIGATION
NAVAL AIR WARFARE CENTER, INDIANAPOLIS
MARION COUNTY, INDIANA

Chemical	Frequency of Detection	Range of Detection			Location of Maximum	Ecological Screening Level (1)	Number Exceeding Screening Level	Background Concentration	Number Exceeding Background Concentration	Selected as a COPC?	Rational
		Min.	Max.	Avg. All							
Semivolatile Organic (ug/kg)											
BIS(2-ETHYLHEXYL)PHTHALATE	1/1	83.0	83.0	83.0	AOC18DP03	6010	0	ND	NA	N	Below screening value
DI-N-BUTYL PHTHALATE	1/1	40.0	40.0	40.0	AOC18DP03	6010	0	ND	NA	N	Below screening value
Inorganic (mg/kg)											
ALUMINUM	1/1	13700	13700	13700	AOC18DP03	50	1	22217	0	N	Below background
ANTIMONY	1/1	0.48	0.48	0.48	AOC18DP03	5	0	ND	NA	N	Below screening value
ARSENIC	1/1	6.9	6.9	6.9	AOC18DP03	19	0	21.3	0	N	Below screening value
BARIUM	1/1	145	145	145	AOC18DP03	412.5	0	222	0	N	Below screening value
BERYLLIUM	1/1	0.67	0.67	0.67	AOC18DP03	10	0	1.13	0	N	Below screening value
CALCIUM	1/1	5600	5600	5600	AOC18DP03	NV	NA	914377	0	N	Low toxicity
CHROMIUM	1/1	17.8	17.8	17.8	AOC18DP03	64	0	27.1	0	N	Below screening value
COBALT	1/1	8.1	8.1	8.1	AOC18DP03	130	0	22.5	0	N	Below screening value
COPPER	1/1	15.1	15.1	15.1	AOC18DP03	63	0	30.3	0	N	Below screening value
IRON	1/1	18200	18200	18200	AOC18DP03	NV	NA	30170	0	N	Below background
LEAD	1/1	17.0	17.0	17.0	AOC18DP03	70	0	61.7	0	N	Below screening value
MAGNESIUM	1/1	2830	2830	2830	AOC18DP03	NV	NA	157362	0	N	Low toxicity
MANGANESE	1/1	781	781	781	AOC18DP03	500	1	2130	0	N	Below background
NICKLE	1/1	14.7	14.7	14.7	AOC18DP03	122.5	0	108	0	N	Below screening value
POTASSIUM	1/1	996	996	996	AOC18DP03	NV	NA	1832	0	N	Low toxicity
SODIUM	1/1	247	247	247	AOC18DP03	NV	NA	120	1	N	Low toxicity
THALLIUM	1/1	1.8	1.8	1.8	AOC18DP03	1	1	2.71	0	N	Below background
VANADIUM	1/1	34.2	34.2	34.2	AOC18DP03	130	0	51.3	0	N	Below screening value
ZINC	1/1	55.7	55.7	55.7	AOC18DP03	200	0	113	0	N	Below screening value

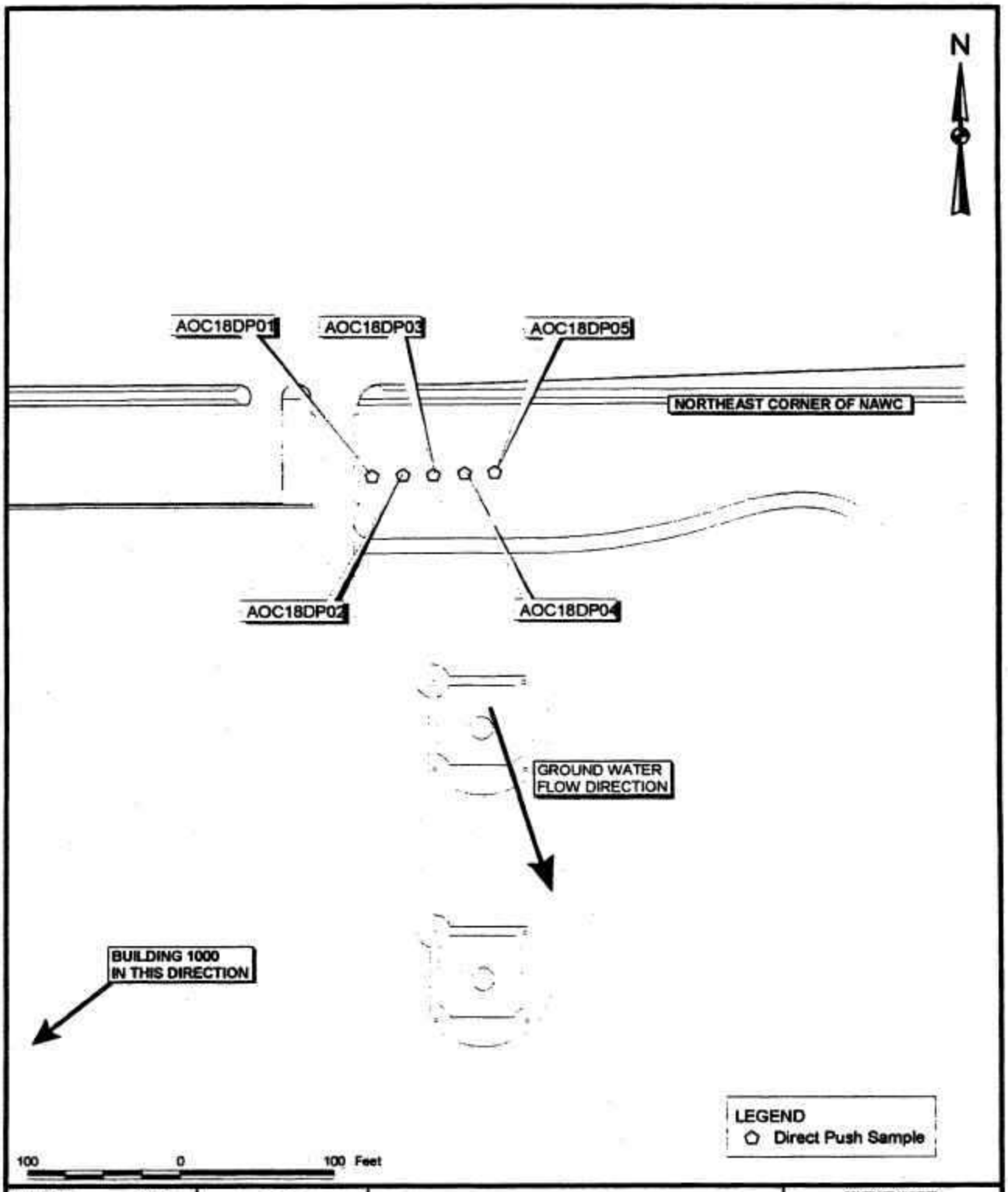
NA - Not Applicable
ND - Not Detected
NV - No Value Established
(1) References for screening levels are presented on Table 2-17

TABLE 8-67

SUMMARY OF TERRESTRIAL WILDLIFE MODEL HAZARD QUOTIENTS - AOC 18
CONSERVATIVE AND AVERAGE INPUTS
PHASE II REMEDIAL INVESTIGATION
NAVAL AIR WARFARE CENTER, INDIANAPOLIS
MARION COUNTY, INDIANA

	Conservative Inputs				Average Inputs			
	Meadow Vole		American Robin		Vole		Robin	
COPCs	NOAEL HQ_n	LOAEL HQ_l	NOAEL HQ_n	LOAEL HQ_l	NOAEL HQ_n	LOAEL HQ_l	NOAEL HQ_n	LOAEL HQ_l
Semivolatile Organics (ug/kg)								
BIS(2-ETHYLHEXYL)PHTHALATE	5.01E-03	5.01E-04	1.85E-01	1.85E-02	4.95E-05	4.95E-06	9.29E-02	9.29E-03
DI-N-BUTYL PHTHALATE	8.03E-05	2.41E-05	8.01E-01	8.01E-02	7.93E-07	2.38E-07	4.52E-01	4.52E-02
Inorganics (mg/kg)								
ANTIMONY		4.24E-01	--	--		1.28E-01	--	--

-- No toxicity data was available for this contaminant so an HQ could not be calculated
Shaded cells are contaminants with HQs greater than 1
HQn - Hazard Quotient for the NOAEL
HQl - Hazard Quotient for the LOAEL



DRAWN BY: CHAD P GLICK — DATE: 25-June-99		AOC 18 RI SAMPLING LOCATIONS NORTHEAST LAND SCAR AREA AOC 18 DECISION DOCUMENT NAVAL AIR WARFARE CENTER INDIANAPOLIS MARION COUNTY, INDIANA	CONTRACT NUMBER: 12
CHECKED BY — DATE			APPROVED BY: K. HENN — DATE: 8/25/99
COST/SCHEDULE-AREA			APPROVED BY — DATE: 7/4/99
SCALE: AS NOTED			DRAWING NO: FIGURE A-1 — REV: 1

P:\GIS\21737\173_PROPOSED_PLAN.APR 8/25/99 CPG AOC 18 LOCATION LAYOUT

AOC 18

APPENDIX B

INSTITUTIONAL CONTROL PLAN

AREA OF CONCERN (AOC) 18 IC PLAN

A. DESCRIPTION OF THE SITE:

AOC 18 consists of the Northeast Land Scar Area located within the NAWC Indianapolis facility. The NAWC is located in Marion County, east of downtown Indianapolis and is bordered by East 21st Street to the north, Arlington Avenue to the west, East 16th Street to the south and Windsor Branch, a surface water tributary to the east.

B. IDENTIFICATION OF RESIDUAL RISK(S) PRESENTED:

Thallium was the only chemical in soil at AOC 18 with concentrations exceeding federal and state risk-based screening criteria. Residential criteria for the protection of groundwater as a drinking water source for thallium was the only criteria exceeded, although the concentrations for thallium were within background levels. No groundwater samples were collected at AOC 18, consequently, it is not knowN if thallium has migrated from soil to groundwater. Thallium was not detected in groundwater samples taken downgradient of the site at concentrations exceeding applicable criteria. Based upon the data collected at this site, the residual risk presented is from the potential for thallium to migrate from soil to groundwater and potentially impact the quality of the groundwater.

C. TYPES OF ICS IMPOSED:

The Navy intends on utilizing deed provisions to impose upon future transferees, their successors, assigns, lessees or licensees of the real property and facilities which encompass AOC 18, those restrictions necessary to ensure continued protection of human health and the environment. Those restrictions may be summarized as follows:

1. A prohibition against residential or residential-like uses of the property without prior authorization from the Navy (the reasonable anticipated future use at this site is industrial);

2. A requirement for annual compliance reporting by the future owner(s) of the NAWC property of the fact the only industrial uses of the property have been allowed and that no groundwater from other than the shallow and middle aquifer has been extracted or used without prior written authorization form the Navy.

D. PROPOSED DEED LANGUAGE IMPLEMENTING ICS:

The following land and groundwater use restriction provisions or their substantial equivalents will be incorporated into the quitclaim deed which shall effect the transfer of the property and facilities encompassing AOC 18 to any transferee:

1. The Grantee its successors, assigns, lessees, and licensees are prohibited from utilizing any portion of the real property and facilities encompassing AOC 18 as depicted in the attached survey for residential or residential type uses without the prior written authorization from the Navy. Such prohibited uses shall include, but not be limited to, nurseries, child or full time adult day care facilities or any playground area. Any additional site evaluation(s), risk assessment(s) and potential remedial measures as may be necessary if future usage of the property is for other than industrial purposes shall be without costs to the United States.

E. PARTY RESPONSIBLE FOR MONITORING THE INTEGRITY AND EFFECTIVENESS OF IMPOSED CONTROL(S):

The Navy intends on maintaining responsibility for overseeing the integrity and effectiveness of the IC remedy selected for AOC 18. The Navy plans on doing this by requiring annual IC compliance reporting by subsequent transferees of the property and facilities encompassing this site and by conducting all required CERCLA Five-Year Reviews.

F. PROCEDURES FOR REPORTING AND ENFORCING AGAINST IC VIOLATIONS

Should the Navy learn that any subsequent owner, occupant or third party has violated or caused to be violated any IC associated with AOC 18, the Navy shall evaluate at that time whether it would be appropriate to exercise the response authorities granted to it under CERCLA Section 104 (42 USC 9604), the Defense Environmental Restoration Program (DERP) (10 USC 2701 et. seq.) and Executive Order 12580, in order to ensure continued protectiveness of the site remedy implemented. The Navy will also evaluate the appropriateness of pursuing whatever rights it may have contractually or otherwise and/or for cost recovery under CERCLA Section 107 (42 USC 9607) against the violator of that IC(s). The Navy shall also promptly notify by letter the appropriate IDEM and U.S. EPA representatives upon learning of any IC violation(s) so that U.S. EPA can initiate whatever enforcement action U.S. EPA may believe to be appropriate at that time against such violator(s).

To ensure the opportunity for the Navy and U.S. EPA to be able to enforce the ICs associated with AOC 18, the Navy shall insert the following provisions or their substantial equivalent into the quitclaim deed which shall effect the transfer of the property encompassing AOC 18 to any third party:

1. The Navy reserves a right of access to all portions of the property for environmental investigation, remediation or other corrective actions. This reservation includes the right of access to and use of, to the extent permitted by law, available utilities at reasonable cost. These rights shall be exercisable in any case in which a remedial action, response action or corrective action is found to be necessary by the Navy after the date of conveyance of the property, or in which access is necessary to carry out a remedial action, response action or corrective action on adjoining property. Pursuant to this reservation, the Navy, the U.S. EPA and the State of Indiana, and their officers, agents, employees, contractors and subcontractors shall have the right (upon reasonable notice to the Grantee or the then owner and any authorized occupant of the property) to enter upon the Property and conduct investigations and surveys, to include drillings, test-pitting, borings, data and record compilation, and other activities related to environmental investigation and to carry out remedial or removal actions as required or necessary under applicable authorities, including but not limited to monitoring wells, pumping wells, and treatment. Any such entry, including such activities, responses or remedial actions, shall be coordinated with the Grantee or its successors assigns, and tenants and shall be performed in a manner which minimizes interruption with Grantee's activities on the property.

2. The Grantee, its successors, assigns, lessees and licensees are prohibited from unreasonably interfering with any environmental investigation or remedial activities to be undertaken by the Navy on the property encompassing AOC 18 or surrounding NAWC property.

G. ASSURANCES REGARDING COMPLETION OF THE CERCLA FIVE-YEAR REVIEW PROCESS:

It is the Navy's intent to fully comply with the requirements of CERCLA as they may continue to apply to AOC 18 and to continue in part to oversee the long term effectiveness of the selected remedy through the timely undertaking and completion of CERCLA Five-Year Reviews.

H. IC RECORDATION / NOTICE REQUIREMENTS:

Those specific lCs reflected in this ICP and in the Proposed Plan (PP) and Decision Document (DD) for AOC 18 will be reflected in the quitclaim deed which shall be used to effect the transfer of the property encompassing AOC 18 and such deed will be recorded in the appropriate local property records office for the property by the transferee(s) of the real property upon which the site is situated. The transferee will be provided advance notice of those ICs and all pertinent site conditions by first being provided with a copy of this plan, the Environmental Baseline Survey (EBS) and requisite Finding of Suitability to Transfer (FOST) prepared by the Navy in connection with such transfer.

I. COMMITMENT TO PRE-TRANSFER MEETING:

To the extent appropriated funds may be available for such purposes, the Navy commits to meet at least five days before transfer with any and all prospective transferees of the real property and facilities encompassing AOC 18 in order to ensure that such transferee(s) fully understands the provisions of this plan.